CSC 101 Intro to Computing
San Francisco State University
Exam Review

1 Java Basics

1. (True / False) Public classes in Java and the name of the .java file MUST be the same.
2. (True / False) Java classes must begin with a captial letter.
3. (True / False) The main method is the entry point to a Java program.
4. (True / False) There is no difference between System.out.print and System.out.println printing functions.
5. (True / False) Java is a case-sensitive language.
6. What character is used to move text or the cursor to the next line?
    A. `\n`
    B. next
    C. `\b`
    D. `\t`
7. What is the extension of the Java source code file?
    A. .c
    B. .cpp
    C. .java
    D. .class
    E. .py
8. What is the marker for starting a line comment in Java?
    A. //
    B. #
    C. /* */
    D. "'
    E. –
    F. /** */
9. What is the marker for starting a block comment in Java?
    A. //
    B. #
    C. /* */
    D. "'
    E. –
    F. /** */

10. What is the marker for starting a JavaDoc comment in Java?
    A. //
    B. #
    C. /* */
    D. "'
    E. –
    F. /** */

11. What is the character used for denoting a Java code block?
    A. { }
    B. [ ]
    C. ( )

12. Every Java statement must end with what character?
    A. ;
    B. ;
    C. .
    D. ,
    E. \n

13. What are the 3 types of errors discussed in class?
    compile time, logic, and run time error

14. What is a syntax/compile time error?
    A syntax/complile time error is when we can detect an error when trying to build the Java program. This comes frome writting code that breaks the language rules.

15. What is a logic error?
    This is a failure in translation of program requirements into code. For example, if you are asked to compute something that involves an express like `(4/3)`, this is an error since the result is 1 and not 1.3

16. What is a runtime error?
    This occurs when our code is running and the Java Runetime environment runs into a situation where it cannot proceed. The simplest example would be dividing by 0 or asking the user for an integer and they enter a character.

17. If a program compiles fine, but it produces incorrect result, then the program suffers _____.
    A. a compile error
    B. a runtime error
    C. a logic error

18. The following code has _____.

```
public class Test {
     public static void main(String[] args) {
       System.out.println("Welcome to Java!);
     }
}
```

   A. a compile error
   B. a runtime error
   C. a logic error

19. The following code has _____.

```
public class Test {
    public static void main(string[] args) {
        System.out.println("Welcome to Java!");
    }
}
```

   A. a compile error
   B. a runtime error
   C. a logic error

2 Elementary Programing

1. Name the eight primitive data types.
   byte, short, int, long, float, double, char , boolean

2. What are their sizes(Number of bits and bytes)? Note: a bit is NOT a primitive type. For example, 1 byte = 8 bits

Type	Bits	Byte
Bit	1	-
Byte	8	-
Short	16	2
int	32	4
long	64	8
float	32	4
double	64	8
char	16	2
boolean	-	-

3. Please answer the folllwing below:
   (a) Declare a variable of type integer with the name x.

```
int x;
```

   (b) Declare a variable of type double with the name money.

```
double money;
```

   (c) Declare and initialize a constant variable of type int with the name max and the value of 3.

```
final int max = 3;
```

   (d) Declare a variable of type String with the name str.

```
String str;
```

   (e) Declare and initialize a variable of type String with the name msg and the value Hello World!.

```
String msg = "Hello World!";
```

   (f) Declare and initialize a variable of type boolean with the name flag and the value of false.

```
boolean flag = false;
```

4. How would you print the string "Yay for Exams!"?

```
System.out.println("Yay for Exams!");
```

5. Name five reserved words.

```
public static void int float byte
```

6. List as many java operators as you can without help from any outside sources.

```
>> >>> << + - * / ++ -- *= /= &= -= += ^= &= |= >>>= >>= <<= ! > >= <= == || && ^ != & |
```

7. How does the increment and decrement operators work? What does it mean for an operator to be post or pre increment/decrement?

```
/*
    The increment operation adds 1 to a variable.
*/
x++
/*
    The decrement operation adds 1 to a variable.
*/
x--
/*
If an operation is a post-(increment/decrement) operation, it means that the original
    value will be used if it a part of an expression.

If an operation is a pre-(increment/decrement) operation, it means that the value AFTER
    the addition/subtraction is used if it is a part of an expression.
*/
```

8. What is Java source code compiled into?
into java byte code

9. Write the equivalent of the following statements
   (a) `y += 1;`

   ```
   y = y + 1;
   ```

   (b) `x /= 2;`

   ```
   x = x / 1;
   ```

   (c) `z = z * 9;`

   ```
   z*=9
   ```

   (d) `i++`

   ```
   i = i + 1;
   ```

   (e) `i--`

   ```
   i = i - 1;
   ```

10. What does `9/10` equal to? Why? What about 9/10.0? Why?
`9/10` is equal to 0 since both operands are int therefore integer division is performed.

11. What is Type Casting / Type Conversion?
Type casting is changing the type of one epxrssion into another. For example, if we want the expression `9/10` to have a floating point result, we can do this in the following way: `(float)9/10`. This would convert the 9 into a float and then do floating point division. Note this is NOT the only way this can be done!

12. Please complete the code snippets below to make them correct:

(a) Assign the variable c to a.

```
int c = 3;
long a;
a = c;
```

(b) Assign the variable of pi to lPi.

```
double pi = 3.1415926535;
long lPi;
lPi = (long)pi;
```

(c) Assign the variable c to intC.

```
char c = 'c';
int intC;
intC = c;
```

(d) Assign the variable s to b.

```
short s = 33;
byte b;
b = (byte)s;
```

(e) Assign the variable i to s.

```
int i = 213124;
short s;
s = (short)i
```

(f) Assign the variable l to b.

```
long l = 331231231;
int b;
b = (int)l;
```

(g) Assign the variable b the value of true.

```
boolean b;
b = true;
```

(h) Assign the variable x the express 3.2 + 1.

```
int x;
x = (int)(3.2 + 1.);
```

(i) Assign the variable x the express 3.2 + 1.

```
double x;
x = 3.2 + 1.;
```

13. What is the exact output of the following code?

```
double area = 3.5;
System.out.print("area");
System.out.print(area);
```

A. 3.53.5
B. 3.5 3.5
C. area3.5
D. area 3.5

14. Which of the following are correct ways to declare variables? Please select all that apply.

A. int length; int width;
B. int length, width;
C. int length; width;
D. int length, int width;

15. _____ is the Java assignment operator.

A. ==
B. :=
C. =
D. =:

16. What is the result of 45 / 4?

A. 10
B. 11
C. 11.25
D. 12

17. Which of the following expression results in a value 1?

A. 2 % 1
B. 15 % 4
C. 25 % 5
D. 37 % 6

18. Suppose x is 1. What is x after x += 2?

    A. 0
    B. 1
    C. 2
    D. 3
    E. 4

19. Suppose x is 1. What is x after x -= 1?

    A. 0
    B. 1
    C. 2
    D. -1
    E. -2

20. What is x after the following statements?

```
int x = 2;
int y = 1;
x *= y + 1;
```

    A. x is 1.
    B. x is 2.
    C. x is 3.
    D. x is 4.

21. What is x after the following statements?

```
int x = 1;
x *= x + 1;
```

    A. x is 1.
    B. x is 2.
    C. x is 3.
    D. x is 4.

22. Which of the following statements are the same?

```
(A) x -= x + 4
(B) x = x + 4 - x
(C) x = x - (x + 4)
```

    A. (A) and (B) are the same.
    B. (A) and (C) are the same.
    C. (B) and (C) are the same.
    D. (A), (B), and (C) are the same.

23. To add a value 1 to variable x, you write _____. Please select all that apply.

    A. 1 + x = x;

    B. x += 1;

    C. x := 1;

    D. x = x + 1;

    E. x = 1 + x;

24. To add number to sum, you write _____. (Note: Java is case-sensitive) Please select all that apply.

    A. number += sum;

    B. number = sum + number;

    C. sum = Number + sum;

    D. sum += number;

    E. sum = sum + number;

25. What is i printed?

```
public class Test {
    public static void main(String[] args) {
        int j = 0;
        int i = ++j + j * 5;

        System.out.println("What is i? " + i);
    }
}
```

    A. 0

    B. 1

    C. 5

    D. 6

26. What is i printed in the following code?

```
public class Test {
    public static void main(String[] args) {
        int j = 0;
        int i = j++ + j * 5;

        System.out.println("What is i? " + i);
    }
}
```

    A. 0

    B. 1

    C. 5

    D. 6

27. What is y displayed in the following code?

```
public class Test {
    public static void main(String[] args) {
        int x = 1;
        int y = x++ + x;
        System.out.println("y is " + y);
    }
}
```

A. y is 1.

B. y is 2.

C. y is 3.

D. y is 4.

28. What is y displayed?

```
public class Test {
    public static void main(String[] args) {
        int x = 1;
        int y = x + x++;
        System.out.println("y is " + y);
    }
}
```

A. y is 1.

B. y is 2.

C. y is 3.

D. y is 4.

29. Are the following four statements equivalent?

```
number += 1;
number = number + 1;
number++;
++number;
```

A. Yes

B. No

30. To assign a double variable d to a float variable x, you write _____.

A. x = (long)d

B. x = (int)d;

C. x = d;

D. x = (float)d;

31. Which of the following expressions will yield 0.5? Please select all that apply.

A. 1 / 2

B. 1.0 / 2

C. (double) (1 / 2)

D. (double) 1 / 2

E. 1 / 2.0

32. What is the output of the following code?

```
double x = 5.5;
int y = (int)x;
System.out.println("x is " + x + " and y is " + y);
```

A. x is 5 and y is 6
B. x is 6.0 and y is 6.0
C. x is 6 and y is 6
D. x is 5.5 and y is 5
E. x is 5.5 and y is 5.0

33. Which of the following assignment statements is illegal?

A. float f = -34;
B. int t = 23;
C. short s = 10;
D. int t = 4.5;

34. What is the value of (double)5/2?

A. 2
B. 2.5
C. 3
D. 2.0
E. 3.0

35. What is the value of (double)(5/2)?

A. 2
B. 2.5
C. 3
D. 2.0
E. 3.0

36. Which of the following expression results in 45.37?

A. (int)(45.378 * 100) / 100
B. (int)(45.378 * 100) / 100.0
C. (int)(45.378 * 100 / 100)
D. (int)(45.378) * 100 / 100.0

37. The expression (int)(76.0252175 * 100) / 100 evaluates to _____.

A. 76.02
B. 76
C. 76.0252175
D. 76.03

38. If you attempt to add an int, a byte, a long, and a double, the result will be a(n) _____ value.

A. byte
B. int
C. long
D. double

3 Selections

1. The "less than or equal to" comparison operator in Java is _____.
   A. <
   B. <=
   C. =<
   D. <<
   E. ! =

2. The equal comparison operator in Java is _____.
   A. <>
   B. ! =
   C. ==
   D. =

3. What is 1 + 1 + 1 + 1 + 1 == 5?
   A. True
   B. False
   C. There is no guarantee that 1 + 1 + 1 + 1 + 1 == 5 is true.

4. Which of the following code displays the area of a circle if the radius is positive?
   A. if (radius ! = 0) System.out.println(radius * radius * 3.14159);
   B. if (radius >= 0) System.out.println(radius * radius * 3.14159);
   C. if (radius > 0) System.out.println(radius * radius * 3.14159);
   D. if (radius <= 0) System.out.println(radius * radius * 3.14159);

5. Compute the following truth tables:

(a)

&&	T	F
T	T	F
F	F	F

(b)

‖	T	F
T	T	T
F	T	F

(c)

∧	T	F
T	F	T
F	T	F

6. Given the following variables, what boolean value do these boolean expressions evaluate to?

```
int x = 5; int y = 9; int k = 0;
a. (x > y) && (k < x)
```

false

```
b. (x > y) || (k < x)
```

true

```
c. (y >= y) && (x < x)
```

false

```
d. !(y == y) || (x < x)
```

false

```
e. !(y != k) && !(k < x)
```

false

7. Suppose income is 4001, what is the output of the following code?

```
if (income > 3000) {
    System.out.println("Income is greater than 3000");
}
else if (income > 4000) {
    System.out.println("Income is greater than 4000");
}
```

A. no output
B. Income is greater than 3000
C. Income is greater than 3000 followed by Income is greater than 4000
D. Income is greater than 4000
E. Income is greater than 4000 followed by Income is greater than 3000

8. The following code displays _____.

```
double temperature = 50;

if (temperature >= 100)
    System.out.println("too hot");
else if (temperature <= 40)
    System.out.println("too cold");
else
    System.out.println("just right");
```

A. too hot
B. too cold
C. just right
D. too hot too cold just right

9. Suppose x = 1, y = -1, and z = 1. What is the output of the following statement? (Please indent the statement correctly first.)

```
if (x < 0)
    if (y > 0)
        System.out.println("x > 0 and y > 0");
    else if (z > 0)
            System.out.println("x < 0 and z > 0");
```

   A. `x > 0` and `y > 0`
   B. `x < 0` and `z > 0`
   C. `x < 0` and `z < 0`
   D. no output.

10. What is the output of the following code?

```
int x = 0;
if (x < 4) {
    x = x + 1;
}
System.out.println("x is " + x);
```

   A. x is 0.
   B. x is 1.
   C. x is 2.
   D. x is 3.
   E. x is 4.

11. Analyze the following code:

```
boolean even = false;
if (even = true) {
    System.out.println("It is even");
}
```

   A. The program has a compile error.
   B. The program has a runtime error.
   C. The program runs fine, but displays nothing.
   D. The program runs fine and displays It is even.

12. Suppose isPrime is a boolean variable, which of the following is the correct and best statement for testing if isPrime is true?

   A. `if (isPrime = true)`
   B. `if (isPrime == true)`
   C. `if (isPrime)`
   D. `if (!isPrime = false)`
   E. `if (!isPrime == false)`

13. Which of the following is the correct expression that evaluates to true if the number x is between 1 and 100 or the number is negative?

    A. $1 < x < 100$ && $x < 0$

    B. $((x < 100)$ && $(x > 1))$ || $(x < 0)$

    C. $((x < 100)$ && $(x > 1))$ && $(x < 0)$

    D. $(1 > x > 100)$ || $(x < 0)$

14. Assume $x = 4$ and $y = 5$, which of the following is true?

    A. $x < 5$ && $y < 5$

    B. $x < 5$ || $y < 5$

    C. $x > 5$ && $y > 5$

    D. $x > 5$ || $y > 5$

15. Assume $x = 4$, which of the following is true?

    A. $!(x == 4)$

    B. $x != 4$

    C. $x == 5$

    D. $x != 5$

16. Assume $x = 4$ and $y = 5$, which of the following is true?

    A. $!(x == 4) \wedge y != 5$

    B. $x != 4 \wedge y == 5$

    C. $x == 5 \wedge y == 4$

    D. $x != 5 \wedge y != 4$

17. Given $|x| <= 4$, which of the following is true?

    A. x <= 4 && x >= 4

    B. x <= 4 && x > -4

    C. x <= 4 && x >= -4

    D. x <= 4 || x >= -4

18. Given $|x| >= 4$, which of the following is true?

    A. x >= 4 && x <= -4

    B. x >= 4 || x <= -4

    C. x >= 4 && x < -4

    D. x >= 4 || x < -4

19. Which of the following is equivalent to $x != y$? Please select all that apply.

    A. !(x == y)

    B. x > y && x < y

    C. x > y || x < y

    D. x >= y || x <= y

20. Suppose x=10 and y=10. What is x after evaluating the expression `(y > 10)&& (x-- > 10)`?

    A. 9

    B. 10

    C. 11

21. Suppose x=10 and y=10. What is x after evaluating the expression `y > 10 && (x++ > 10)`?
    A. 9
    B. 10
    C. 11

22. Suppose x=10 and y=10. What is x after evaluating the expression `(y >= 10)`— (x– ¿ 10)—?
    A. 9
    B. 10
    C. 11

23. Suppose x=10 and y=10. What is x after evaluating the expression `(y >= 10)`— (x++ ¿ 10)—?
    A. 9
    B. 10
    C. 11